

WHAT IS CLAIMED IS:

1                   1.       A method of reducing power required for transmitting a signal from a  
2 first transceiver to a second transceiver, comprising the acts of:  
3                   estimating an excess amount of power used by said first transceiver for  
4 transmitting said signal;  
5                   reducing a power use of said first transceiver by said excess amount of power  
6 to a reduced power level; and  
7                   transmitting said signal from said first transceiver using said reduced power  
8 level, wherein said reduced power level achieves a transmission rate of said signal within a  
9 predefined tolerance of a target rate thereof.

1                   2.       The method of claim 1, wherein said first transceiver is located at one  
2 of a central office and a remote loop carrier, and comprises a downstream transmitter and an  
3 upstream receiver, and wherein said second transceiver is located at an end user location and  
4 comprises an upstream transmitter and a downstream receiver.

1                   3.       The method of claim 2, wherein said excess amount of power for said  
2 signal is estimated in accordance with a measured value of upstream attenuation.

1                   4.       The method of claim 3, wherein said measured value of upstream  
2 attenuation is calculated as a difference between a total transmit power transmitted from said  
3 upstream transmitter and a measured power of an upstream signal received at said upstream  
4 receiver.

1                   5.       The method of claim 4, wherein a value of said excess amount of  
2 power of said signal is associated with a value of said upstream attenuation in a table.

1                   6.       The method of claim 2, wherein said first transceiver estimates a per  
2 carrier signal-to-noise ration (SNR) in accordance with bit-per-carrier, power-per-carrier, and  
3 SNR margin information received from said second transceiver.

1                   7.       The method of claim 6, wherein said first transceiver uses said bit per  
2 carrier information for estimating a rate of said signal and a rate of said signal transmitted at a  
3 selected reduced power level, for ensuring said transmission rate is maintained within said  
4 predefined tolerance.

1           8.     The method of claim 7, wherein a second initialization is required for  
2 transmitting said signal at said reduced power level.

1           9.     The method of claim 2, wherein said first transceiver reduces said  
2 power in accordance with an excess SNR provided by said second transceiver.

1           10.    The method of claim 9, wherein a second initialization is required for  
2 transmitting said signal at said reduced power level.

1           11.    The method of claim 2, wherein said excess amount of power is  
2 estimated by estimating an excess amount of SNR at said second transceiver for said target  
3 rate.

1           12.    The method of claim 2, wherein said first transceiver provides said  
2 second transceiver with a minimum SNR inflated by a value N corresponding to said excess  
3 amount of power, and wherein said first transceiver transmits at a power level reduced by  
4 said value N if said second transceiver is capable of supporting said minimum SNR inflated  
5 by said value N.

1           13.    A method of reducing power required for transmitting a signal from a  
2 first transceiver to a second transceiver, comprising the steps of:

3               determining at said second transceiver an amount of excess power in said  
4 signal transmitted from said first transceiver;

5               calculating at said second transceiver an attainable reduced power level for  
6 said transmitted signal; and

7               communicating said reduced power level between said second and first  
8 transceivers, wherein said first transceiver adjusts its power level prior to a time period that  
9 would require a second initialization.

1           14.    The method of claim 13, wherein said second transceiver indicates a  
2 power cutback implicitly by reducing power-per-carrier information communicated to said  
3 first transceiver.

1           15.    An apparatus for reducing power required for transmitting a signal  
2 from a central office asymmetric digital subscriber line (ADSL) termination unit (ATU-C) to

3 a remote ADSL termination unit (ATU-R), wherein said ATU-C includes a processor for  
4 controlling said ATU-C to implement processing including the acts of:  
5 estimating an excess amount of power used by said ATU-C for transmitting  
6 said signal;  
7 reducing a power use of said ATU-C by said excess amount of power to a  
8 reduced power level; and  
9 transmitting said signal from said ATU-C using said reduced power level,  
10 wherein said reduced power level achieves a transmission rate of said signal within a  
11 predefined tolerance of a target rate thereof.

1 16. The apparatus of claim 15, wherein said excess amount of power for  
2 said signal is estimated in accordance with a measured value of upstream attenuation.

10 17. The apparatus of claim 16, wherein said measured value of upstream  
2 attenuation is calculated as a difference between a total transmit power transmitted from said  
3 ATU-C and a measured power of an upstream signal received at said ATU-C.

14 18. The apparatus of claim 17, wherein a value of said excess amount of  
2 power of said signal is associated with a value of said upstream attenuation in a table.

16 19. The apparatus of claim 15, wherein said ATU-C estimates a per carrier  
2 signal-to-noise ration (SNR) in accordance with bit-per-carrier, power-per-carrier, and SNR  
3 margin information received from said ATU-R.

1 20. The apparatus of claim 19, wherein said ATU-C uses said bit per  
2 carrier information for estimating a rate of said signal and a rate of said signal transmitted at a  
3 selected reduced power level, for ensuring said transmission rate is maintained within said  
4 predefined tolerance.

1 21. The apparatus of claim 20, wherein a second initialization is required  
2 for transmitting said signal at said reduced power level.

1 22. The apparatus of claim 15, wherein said ATU-C reduces said power in  
2 accordance with an excess SNR provided by said ATU-R.

1 23. The apparatus of claim 22, wherein a second initialization is required  
2 for transmitting said signal at said reduced power level.

1           24.     The apparatus of claim 15, wherein said excess amount of power is  
2 estimated by estimating an excess amount of SNR at said ATU-R for said target rate.

1           25.     The apparatus of claim 15, wherein said ATU-C provides said ATU-R  
2 with a minimum SNR inflated by a value N corresponding to said excess amount of power,  
3 and wherein said ATU-C transmits at a power level reduced by said value N if said ATU-R is  
4 capable of supporting said minimum SNR inflated by said value N.

1           26.     An apparatus for reducing power required for transmitting a signal  
2 from a central office asymmetric digital subscriber line (ADSL) termination unit (ATU-C) to  
3 a remote ADSL termination unit (ATU-R), wherein said ATU-R includes a processor for  
4 controlling said ATU-R to implement processing including the acts of:

5                 determining an amount of excess power in said signal transmitted from said  
6 ATU-C;

7                 calculating an attainable reduced power level for said transmitted signal; and  
8                 communicating said reduced power level to said ATU-C, wherein said ATU-C  
9 adjusts its power level prior to a time period that would require a second initialization.

10           27.     The apparatus of claim 26, wherein said ATU-R indicates a power  
11 cutback implicitly by reducing power-per-carrier information communicated to said ATU-C.